

FUTURE SPACE TRANSPORTATION FLPP AUTUMN SESSION 2025



VPX CARDS THEMIS

G.L. ELECTRONIC s.r.o

Location: Czech Republic

Founded: 2008

Employees: 30

Mission: G.L. Electronics s.r.o. is a SME based in the Czech Republic. Since 2008, the company has been providing comprehensive solutions for the design, manufacturing and testing of Hi-Rel electronic devices, including cable harness assembly and PCB mounting, primarily for the space industry.



ESA VPX CARDS THEMIS ACTIVITY

Project name: High-Performance electronics: VPX cards

Objective: Since 2022 GLE has been developing its own VPX card designs based on the OpenVPX VITA standards. VPX cards offer cutting-edge performance and reliability across a wide range of mission-critical applications in the space, aerospace and defence industry. The VPX card technology introduces a modular, standardised approach to high-speed computing and data acquisition in demanding environments.

Applications

- Launchers (integrated in Themis MCU)
- Advanced Avionics Systems
- Command and Control Platforms
- Next-Generation Radar Systems
- Unmanned Aerial and Ground Vehicles (UAVs/UGVs)
- Modern Combat Vehicles.

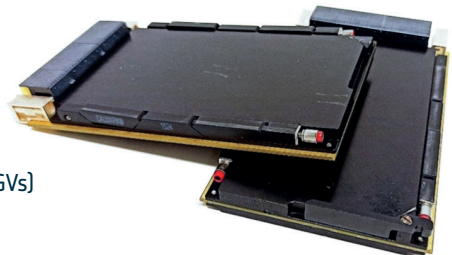


Figure 1 VPX cards EQM

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Contact: Zdenek Ancik, zdenek.ancik@glelectronic.cz, +420 734 499 204

Website and Socials: www.glectronic.space/en/home
www.cz.linkedin.com/company/g-l-electronic

TECHNOLOGY AND INNOVATION

What we developed: The VPX card technology introduces a modular, standardised approach to high-speed computing and data acquisition in demanding environments.

Unique feature: High-speed serial interconnects (PCIe, Gigabit Ethernet) support rapid data transfer and real-time processing, built-in autonomous testing and environmental hardening reduce system failures and maintenance needs, modular, standardised design allows flexible combination of computing and sensor modules, 3U form factor for compact high-density solution, cost efficiency.

KEY RESULTS

The three types of cards have been developed in TRL 6:

- RTD sensor acquisition card: up to 10 RTD channels.
- Pressure sensor acquisition card: up to 6 strain gauge pressure channels (6-wire, 20 mV).
- I/O communication card: 2x RS422, 2x RS232 full-duplex, 4x CAN, 2x ARINC 429. Interfaces: PCIe and Gigabit Ethernet for high-speed data transfer.

The cards are compliant with VPX / OpenVPX (VITA 46.0/46.4/46.6) standards and include

- Communication protocols: RS422, RS232, CAN, ARINC 429 compliant, supporting interoperability with industrial, aerospace, and defence systems.
- Built-in autonomous test (BIT): Facilitates system verification and diagnostics in line with embedded system reliability practices.

NEXT STEPS AND MARKET READINESS

- **Roadmap:** The TRL 8 will be achieved in the scope of SALTO project.
- **Opportunities:** Looking for potential users or integrators of VPX technology, including system integrators, laboratories, or developers of embedded systems and sensor-based platforms. Several domains of application: aerospace, defence, industrial automation, telecommunications, or scientific research.
- **Target launch:** 04/2026